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NATIONAL IRANIAN OIL REFINING & DISTRIBUTION NIOEC
NATIONAL IRANIAN OIL ENGINEERING
& CONSTRUCTION NIOEC

NIOEC SP

NIOEC SPECIFICATION FOR MISCELLANEOUS INSTRUMENTS

SECOND EDITION

DECEMBER, 2015

THIS SPECIFICATION IS THE PROPERTY OF NATIONAL IRANIAN OIL ENGINEERING & CONSTRUCTION NIOEC. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED TO THE OWNER. NEITHER WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF THE NATIONAL IRANIAN OIL ENGINEERING & CONSTRUCTION NIOEC.

IN THE NAME OF GOD**FOREWORD**

By their very nature, technical Specifications are continuously subject to modifications and revisions. To strengthen their merit and usefulness, continuous improvements, addendum, deletion of disparate information and consequently provision of updated revisions are to be made in order to ascertain that such Specifications meet the current requirements, inclusive of Iranian Petroleum Standards (IPS) and the recognized and acceptable national and international Standards, as well as the optimal codes and practices based on the accumulated in-house know-how and plant knowledge and experiences.

However, in reality, due to several reasons, not to mention the complexity of the matter, the ultimate goal of continuous direct embedment of the required changes on the relevant Specifications may be far reaching. Therefore, in the interim periods between the officially issued revisions, the required changes will appear in other documents related to the engineering and design work of the ongoing projects.

In response to the initiative of the Design and Engineering Directorate, and considering that the task of the execution of several important and mega projects for the realization of the new oil refineries, pipelines and oil terminals as well as improvements of the existing facilities, has been assigned to NIOEC, it was decided to update the NIOEC Specifications and to issue new official revisions.

The Design and Engineering Directorate was itself entrusted to carry out this important task, and as such by forming several special technical committees, working in close co-operation and cohesion and sharing their expertise and knowledge, the updated and revised NIOEC Specifications were successfully prepared and complied.

These Specifications are intended to be used for Oil Refineries, Distribution Depots, Oil Terminals, Pipelines and Pump Stations within NIOEC's projects, and have been proven to be of high value for such purposes. It must however be appreciated that these Specifications represent the minimum requirements and should in no way be interpreted as a restriction on the use of better procedures, engineering and design practices or materials.

We encourage and highly appreciate the users and other clear sighted and experts to send their comments on the Specifications to the Design and Engineering Director of NIOEC for evaluation and approval.

REVISION INDEX

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NOTES:

- 1) THIS SHEET IS A RECORD OF ALL REVISIONS TO THIS SPECIFICATION.
- 2) WHEN APPROVED EACH REVISION SHALL BE CONSIDERED AS A PART OF THE ORIGINAL DOCUMENT.
- 3) NUMBER OF PAGES EXCLUDES THIS SHEET AND THE COVER SHEET.

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3	DECEMBER, 2015	M. M. KHARAZI	H. SHIRINPOUR	M. ORDOOBADI	A.ARMAN MOGHADAM
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1. SCOPE

This specification defines NIOEC'S minimum requirements for miscellaneous instrumentation supplied with:

- Packaged Equipment Instrumentation,
- Rotating Machinery Instrumentation,
- Flare System Instrumentation.

Deviations from this specification will only be permitted on obtaining written approval from NIOEC.

Resolution on cases not explicitly stipulated in this Specification, or on cases where conflicts may arise among the requirements of the referenced IPS and the international standards, shall be made through written consent and approval of NIOEC.

2. REFERENCES

The following standards, codes, and specifications, to the extent specified hereinafter, shall constitute a part of this NIOEC Specification. Latest edition of the undated referenced documents and the cited edition of the dated references shall apply. The applicability of changes made to the dated references ,after the cited date shall be mutually agreed upon between NIOEC and the Vendor / Contractor.

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

API (AMERICAN PETROLEUM INSTITUTE)

API RP 500	"Classification of Locations for Electrical Installations at Petroleum Facilities Classified As Class I, Division 1 and Division 2"
ANSI/API STD 521	"Pressure Relieving and Depressuring Systems"
API RP 551	"Transmission Systems"
API RP 553	"Refinery Control Valves"
API RP 554	"Process Control Systems"
API STD 670	"Machinery Protection Systems"

IEC (INTERNATIONAL ELECTRO TECHNICAL COMMISSION)

IEC 60079	"Explosive Atmospheres"
IEC 60529	"Classification of Degrees of Protection Provided by Enclosures"

IPS (IRANIAN PETROLEUM STANDARD)

IPS-M-IN-280	"Material Standards for Miscellaneous Items"
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ISA (INSTRUMENT SOCIETY OF AMERICA)

ISA RP 12.06.01	"Wiring Methods for Hazardous (Classified) Locations Part 1: Intrinsic Safety"
ISA/ANSI 5.1	"Instrumentation Symbols and Identification"
ISA 5.3	"Graphic Symbols for Distributed Control/Shared Display, Logic and Computer Systems"
ISA 5.4	"Instrument Loop Diagrams"
ANSI/ISA 7.0.01	"Quality Standard for Instrument Air"

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)

NFPA 70	"National Electrical Code (NEC)"
NFPA 496	"Standard for Purged and Pressurized Enclosures for Electrical Equipment"
NFPA 497	"Recommended Practice for the Classification of Flammable Liquids, Gases or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas"

NIOEC-SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	"Specification for Units"
NIOEC-SP-70-01	"Specification for Instrumentation"
NIOEC-SP-70-02	"Specification for Instrument Installation"
NIOEC-SP-70-03	"Specification for Instrument Installation Material"
NIOEC-SP-70-07	"Specification for Instrumentation & Control System Calibration, Inspection and Tests"
NIOEC-SP-70-08	"Specification for Process Control System (PCS)"
NIOEC-SP-70-14	"Specification for Control Panels and System Cabinets"
NIOEC-SP-70-16	"Specification for Factory Inspection and Testing of General Instrument Systems"
NIOEC-SP-47-09	"Specification for Packaged Equipment"

UL (UNDERWRITER LABORATORY)

UL-913	"Intrinsically Safe Apparatus and Associated Apparatus, for Use in Class I, II and III, Division 1, Hazardous (Classified) Locations"
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U.S. MIL SPECS (U.S. MILITARY SPECIFICATIONS)

MIL-DTL-3786G	"Detail specification: Switches, Rotary (Circuit selector, Low-Current Capacity), General Specification for"
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3. UNITS

International System of Units (SI) shall be used in accordance with NIOEC-SP-00-10, unless otherwise specified.

4. DEFINITIONS

4.1. Purchaser

In cases where this specification is part of a direct order, Purchaser shall mean National Iranian Oil Engineering and Construction NIOEC. Where this specification forms part of contract documents, purchaser shall mean contractor. In references to inspection by purchaser when this specification forms part of contract documents this shall be construed to mean that NIOEC shall also have the right of inspection.

4.2. Packaged Unit

"Packaged Unit" is defined as a prefabricated process or utility unit, which can operate autonomously.

4.3. Instrument or Instrument Systems for Packaged Units

- Defined as those instruments or instrument systems necessary to build the packaged unit, as provided by the manufacturer of the unit;
- May also include instruments provided by NIOEC, which are those instruments or instrument systems necessary to build the packaged unit supplied free of charge to the equipment package manufacturer by, or on behalf of, the NIOEC.

Note:

All test equipment for this purpose shall be made available by the manufacturer/vendor.

4.4. Loops in the Packaged Unit

- Local control loops including local control panels;
- Remote control loops, are control loops linked to the main control room through junction boxes installed inside the packaged unit. The primary element, final control element and the transmitter are mounted inside the package, only the receiver/controller is located in the main control room.

4.5. Installation Materials for Packaged Unit Instrumentation

Are miscellaneous items of material required for the installation of instruments in the packaged equipment such as tubing, fittings, cables, etc.

5. PACKAGED UNIT INSTRUMENTATION

5.1. General Requirements

5.1.1. Extent of Supply

- 5.1.1.1. The instrumentation for those packaged equipment shall be subject to NIOEC's approval where full instrumentation is provided by the manufacturer's/vendor's standard packaged equipment. The type of instruments at the interfaces of such a package shall be clearly defined and agreed by NIOEC prior to order placement according to the pertinent sections of this specification and the contract documents.